Tashkent Solar PV and BESS Project

Republic of Uzbekistan

Environmental and Social Impact Assessment (ESIA)

Volume I: Non-Technical Summary

January 2024, v1.1

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CONTENTS

LIST OF ABBREVIATIONS

ABBREVIATION	MEANING
AIIB	Asian Infrastructure Investment Bank
AoI	Area of Influence
BAP	Biodiversity Action Plan
BESS	Battery Energy Storage System
BMEP	Biodiversity Monitoring and Evaluation Plan
BMP	Biodiversity Management Plan
BMS	Battery Management System
CEEC	China Energy Engineering Corporation
CESMP	Construction Environmental & Social Management Plan
CHA	Critical Habitat Assessment
CLOs	Community Liaison Officers
COD	Commercial Operation Dates
DEG	German Investment Corporation
DFIs	Development Finance Institutions
EBRD	European Bank for Reconstruction and Development
EIA	Environmental Impact Assessment
EMS	Energy Management System
E&S	Environmental and Social
ESIA	Environmental and Social Impact Assessment
ESMS	Environmental and Social Management System
FGD	Focus Group Discussions
GBV	Potential Gender-Based Violence
GIIP	Good International Industry Practice
HGVs	Heavy Goods Vehicles
HSSE	Health Safety Security and Environmental
HVAC	Heating, Ventilation and Air Conditioning
IFIs	International Financial Institutions
IsDB	Islamic Development Bank
JSC	Joint-Stock Company
KIIs	Key Informant Interviews
LALRP	Land Acquisition and Livelihood Restoration Plan
LGA	Local Government Authorities
LILO	Loop-In-Loop-Out
LLA	Land Lease Agreement
MEEPCC	Ministry of Ecology, Environmental Protection and Climate Change
NGOs	Non-Governmental Organizations
O&M	Operation and Maintenance

ABBREVIATION	MEANING
OESMP	Operational Environmental & Social Management Plan
OTL	Overhead Transmission Line
PAC	Project-Affected Communities
PBF	Priority Biodiversity Features
PPA	Power Purchase Agreement
SEP	Stakeholder Engagement Plan

1 INTRODUCTION

1.1 Project Rationale and Roadmap

Uzbekistan is amongst the fastest growing economies in the Central Asian region, with an increasing demand for energy. By 2018, the country's power consumption reached 50 million TWh, and the domestic demand for power has been projected to rise at an annual rate of 4%, due to continued population growth and industrial expansion. The steady uptrend in power consumption, declining yield of aged power plants and emergent climatic pressures have led to unprecedented power supply shortages, particularly within the regions of Tashkent, Andijan, Namangan, Ferghana, Samarkand, and Surkhandarya. In December 2022, severe grid congestion ensued from widespread spikes in electrical demand for domestic heating under extreme winter temperatures, culminating in a series of power blackouts across Tashkent Region. The emerging power crisis in Uzbekistan has prompted an urgent agenda for the development of the country's renewable energy base. This movement falls in line with the country's policy shift towards decarbonization and a greener economy.

On 19 March 2023, the Joint-Stock Company (JSC) National Electric Grid of Uzbekistan (NEGU) entered into a Power Purchase Agreement (PPA) with ACWA Power (hereinafter Project Developer), for the fast-track development and operation of a 400-megawatt (MW) PV plant and a 500-megawatt hour (MWh) Battery Energy Storage System (BESS) in Tashkent Region. The agreement will be executed over a period of 25 years and 20 years from the Commercial Operation Dates (COD) for the PV plant and BESS components respectively. Upon the completion of the agreement term, the project facilities will be handed over to the off-taker (NEGU) for subsequent operation and maintenance (O&M).

To this end, the project company, ACWA Power Riverside Solar LLC, was nationally registered on 23 March 2023. With the project planning in progress, The Project Developer is seeking international financing from Development Finance Institutions (DFIs) including the European Bank for Reconstruction and Development (EBRD), German Investment Corporation (DEG), Asian Infrastructure Investment Bank (AIIB), Islamic Development Bank (IsDB), Saudi EXIM Bank and Proparco/ French Development Agency (AFD) (hereinafter Project Lenders).

To ensure comprehensive planning and permitting, in keeping with applicable E&S appraisal criteria, the Project Developer has commissioned 5 Capitals (hereinafter the Consultant) to undertake a bankable Environmental and Social Impact Assessment (ESIA) for the Project. The Consultant has engaged Juru and NBT as local sub-consultants in the delivery of the national EIA and support on certain elements of the bankable E&S impact assessment studies.

1.2 E&S Assessment Background

1.2.1 National EIA

The Project is subject to a phased national EIA study aimed at assessing potential E&S impacts and developing appropriate management measures, in accordance with national laws and regulations. The outcomes of this appraisal are positive conclusions for each stage of the study for both project components (i.e., PV power plant, and BESS with interconnection cable).

The PZVOS for the development of the PV plant was undertaken by Nazar Business and Technology (NBT), and a positive conclusion (PZVOS approval) for this assessment was issued on 2nd June 2023. A separate PZVOS study for the development of the BESS facility was conducted by Juru Limited, and a positive conclusion for this assessment was issued on 15th September 2023.

MEEPCC (the regulator) has issued 'positive conclusions' for the first stage of the national EIA (PVOS) for the project components, thereby permitting the completion of all construction works planned under the Project and obviating the requirement for the second (conditional) stage of the national EIA (ZVOS) in advance of construction. Subsequently, the completion of the third stage of the national EIA (i.e., ZEP) and issue of a positive conclusion for this assessment will precede the start of any commissioning and operational activities planned under the Project.

1.2.2 Bankable ESIA

Based on the prospective DFI financing, the Project is also subject to a bankable ESIA study aimed at ensuring (i) statutory E&S compliance, (ii) delivery on ratified E&S convention commitments, and (iii) alignment with the mandates, policy objectives, national and sectoral strategies, and E&S requirements of the Project Lenders.

The bankable ESIA commenced with the preparation of the ESIA Scoping Report, which served to identify the key E&S risks and impacts associated with the Project's planned facilities, and the extent of baseline surveys and stakeholder engagement to assess potential impacts, in order for adequate prevention and mitigation planning. The ESIA scoping report was submitted to the Project Lenders and Lenders' Environmental Advisor (LEA) on 6th August 2023, for technical reviews and feedback.

Subsequently, the ESIA study was carried out and documented in the ESIA documents package (i.e., detailed coverage is provided in the ESIA Volume II). Volume II (main text) of the ESIA report was submitted to the LEA and Project Lenders on 12th October 2023, for technical reviews and feedback prior to public disclosure. Beyond the ESIA report, the final

E&S safeguard documents package prepared for the Project include the Land Acquisition and Livelihood Restoration Plan (LALRP) and Stakeholder Engagement Plan (SEP).

The objectives of this ESIA in relation to this project include the following:

- Provide an overview of the Project design, identification of sensitive receptors in the Project's area of influence and assessment of Project alternatives.
- Assessment of baseline conditions prior to the development of the Project through review of available data and conducting surveys.
- Assessment of the project's environmental and social impacts for the construction and operational phases.
- Review of compliance obligations, including applicable Uzbekistan regulations and international regulations and standards as well as international lender requirements.
- To engage with key stakeholders and project affected people to disclose Project information, study outcomes, gain lay knowledge about the local environmental and social context, seek feedback on proposal and to understand and map any resettlement requirements.
- Determination of applicable mitigation and management measures including monitoring requirements to be implemented in order to avoid or minimise potential impacts and maximise potential environmental and social gains.
- Consideration of alternatives that can be used for the project leading to reduced impacts and/or greater social and environmental gains.
- Prepare a framework from which the construction phase and operational phase respective environmental and social management systems and plans can be developed and implemented.

1.3 Objectives of the ESIA Non-Technical Summary

The Non-Technical Summary (NTS) of the ESIA provides a summary description of the project plans, design, E&S risk assessment processes, and potential E&S risks and impacts during the Project's construction and operation phases. The NTS also provides an outline of impact avoidance and mitigation measures, and subsequent plans, for the management of the risks and impacts.

The NTS serves to provide a summary account of the ESIA basis and outcomes, in line with the requirements for stakeholder engagement and public disclosure, which are elaborated in the Stakeholder Engagement Plan (SEP), which constitutes the Project's E&S safeguard documents package.

2 PROJECT DESCRIPTION

2.1 Key Project Information

Table 2-1 Key Project Information

PROJECT TITLE	Tashkent Solar PV and BESS Project
PROJECT DEVELOPER	ACWA Power
PROJECT COMPANY	ACWA Power Riverside Solar LLC
OFF TAKER	JSC National Electric Grid of Uzbekistan
EPC CONTRACTOR	China Energy Engineering Corporation (CEEC)
O&M COMPANY	NOMAC
ENVIRONMENTAL CONSULTANT	5 Capitals Environmental and Management Consulting (5 Capitals) PO Box 119899, Dubai, UAE Tel: +971 (0) 4 343 5955, Fax: +971 (0) 4 343 9366 www.5capitals.com
	Juru Consulting LLC Chust Str. 10, 100077, Tashkent, Uzbekistan Tel: +998 71 202 0440, Fax: +998 71 2020440 Nazar Business and Technology LLC, registered in the Uzbekistan and having its principal place of business at 14 Bekarik Street, Suite 7, Yakkasaray district, Tashkent City, Uzbekistan
POINT OF CONTACT	Ken Wade (Director), Ken.wade@5capitals.com

2.2 Project Location

The Project consists of two main components, namely the Photo-Voltaic (PV) power station and the Battery Energy Storage System (BESS). The PV plant and the BESS facility are situated 3.5 km apart, within Yuqorichirchik District and Parkent District respectively. Both districts are located within Tashkent Region. The overall project location lies about 20 km from Tashkent City.

The collector sub-station that will be located within the PV plant site will export generated power to an adjacent 220kV Overhead Transmission Line (OTL), which extends along the southern and eastern boundary of the PV plant site towards an existing sub-station situated 700 metres south of the BESS site. The collector sub-station will be connected to the grid by a Loop-In-Loop-Out (LILO) connection measuring a length of about 200 metres.

The locations of the planned PV plant and BESS facilities relative to those of the existing 220kV OTL and sub-station are shown in Figure 2-1 below.

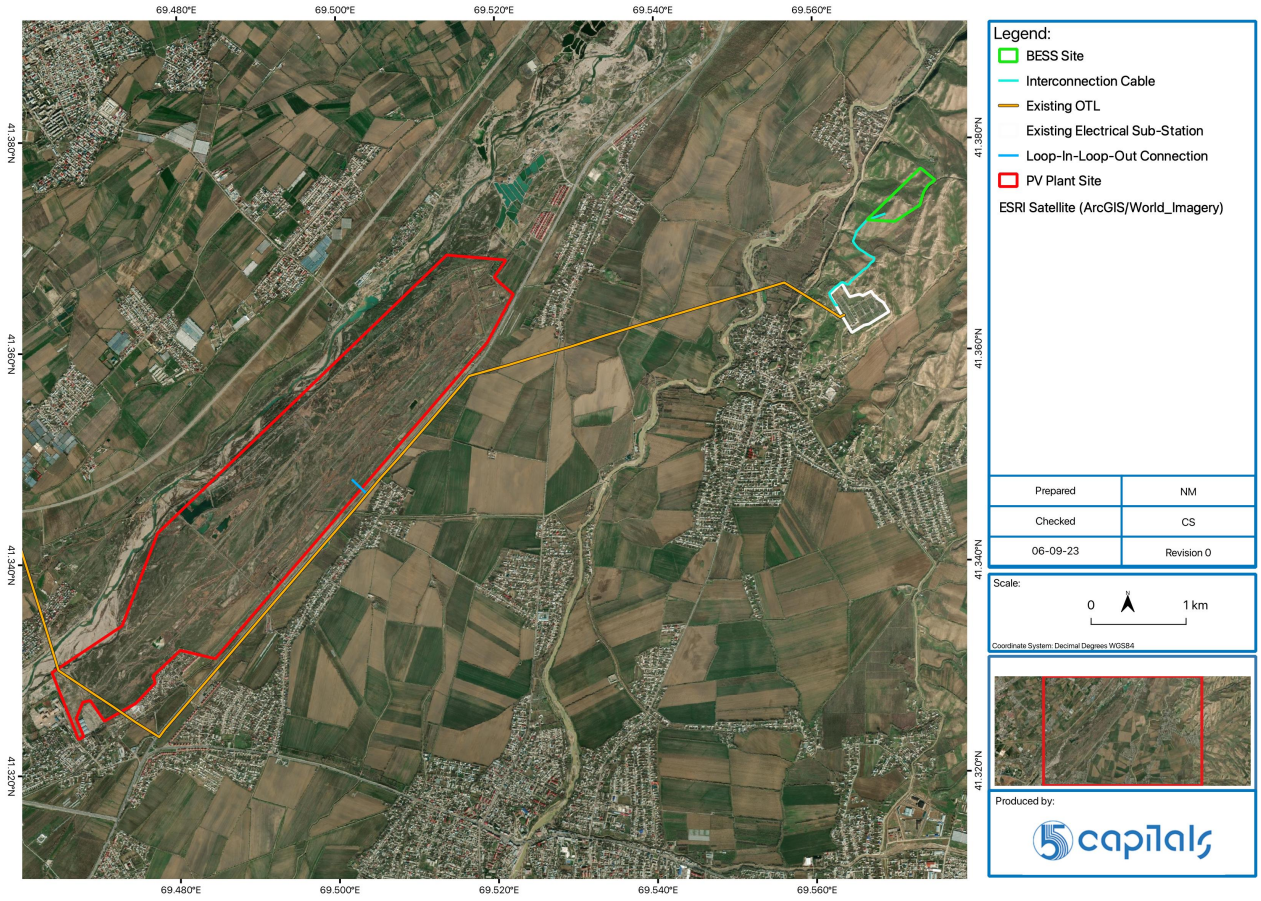

Figure 2-1 Location of the planned PV plant and BESS relative to existing OTL and sub-station

The GPS coordinates for the PV plant and BESS sites are provided in the table below.

LATITUDE	LONGITUDE
PV plant site	
41.325191°	69.470523°
41.330067°	69.464979°
41.365295°	69.522204°
41.369126°	69.514002°
BESS site	
41.366310°	69.563611°
41.365157°	69.562050°
41.363517°	69.569715°
41.361561°	69.564812°

2.3 Project Facilities

Project facilities planned for the Project's construction and operational phases can be split into several categories, based on their relation to the project and the financing agencies involved in the development of these facilities.

2.3.1 Main facilities

The main facilities refer to facilities planned as part of the project, which are of primary importance to the Project's operational objectives and funded by the Project Lenders.

These facilities comprise the solar (PV) power plant and the BESS. The PV plant components will serve the following main functions:

- Generation of solar power.
- Conditioning of the raw electrical output, for conformity with the operational standards of the recipient utility grid.
- Evacuation of power harnessed by the PV plant to the recipient utility grid.

The main functions of the BESS include:

- Storage of surplus power in the utility grid during periods of off-peak demand.
- Controlled discharge of stored power to the utility grid during periods of limited production and/or peak-demand.

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2.3.1.1 Solar power (PV) plant

The solar (PV) plant sited within Yuqorichirchik District will operate at a capacity of 200 MW, with a total estimated lifetime yield of 11,861,233 MWh. The PV plant components involved in the generation of electricity from solar radiation are described as follows.

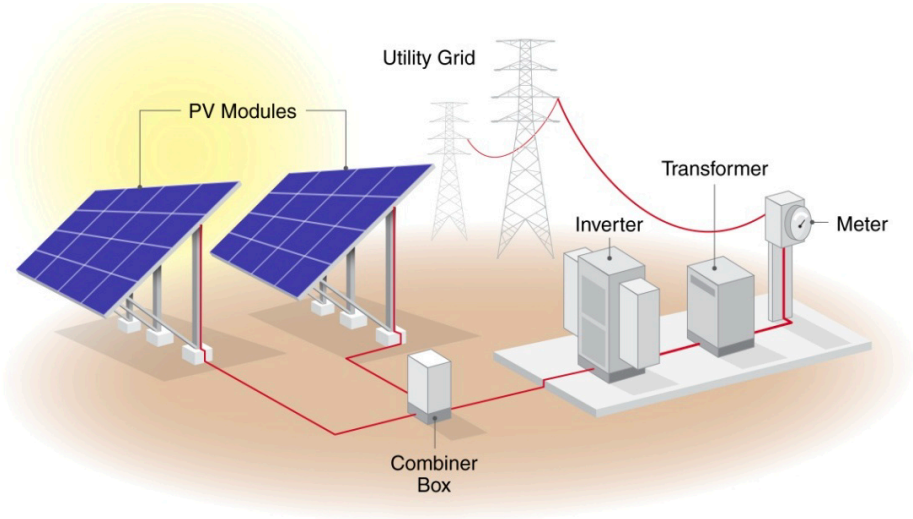

Figure 2-2 Illustration of the configuration of utility-scale PV power plants

The PV power plant consists of the following facilities:

- Solar modules, panels and strings
- Solar trackers and mounting system
- Central combiner boxes
- Inverters
- Medium-voltage step-up transformers
- Collector sub-station

2.3.1.2 Battery Energy Storage System

The Project will also involve the establishment of a 500 MWh AC-coupled Battery Energy Storage System (BESS). The BESS will operate on an independent basis (separately from the PV plant) and be developed close to the existing sub-station. The BESS facility will serve the following main functions:

- Storage of electrical energy from power sources feeding into the project-associated utility grid during off-peak grid time, and the dispatch of the operating reserves in the event of grid congestion (i.e., instances of power demand exceeding power supply).
- Stabilization of the frequency of the project-associated utility grid by provisioning power reserves to equalize power demand and power supply within the grid.

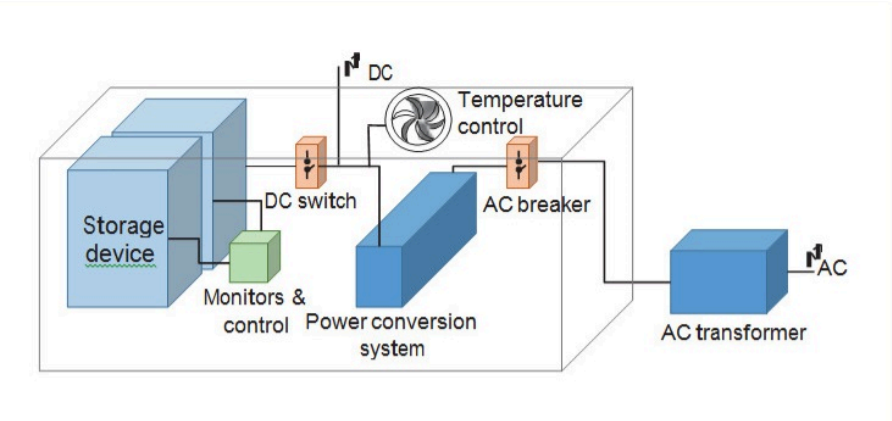

Figure 2-3 General schematic of a BESS facility

The BESS consists of the following facilities:

- Battery assembly
- Battery Management System (BMS)
- Power Conversion System (PCS)
- Grid connection
- Energy Management System
- Heating, Ventilation and Air Conditioning System (HVAC)

2.3.2 Ancillary facilities

This set of project facilities will be established for auxiliary purposes during the Project's construction and operational phases, such as general maintenance and connection to enabling utility infrastructure.

2.3.2.1 Construction enabling and maintenance

The following ancillary facilities will be established to enable construction activities planned under the Project:

- Access roads
- Laydown areas
- Concrete supply
- Construction site offices and welfare facilities
- Sanitation facilities
- Solid waste facilities
- Security system

2.3.2.2 Operations and maintenance

The following ancillary facilities will be established to enable construction activities planned under the Project.

- Drainage system
- Fire safety system
- Lightning protection system
- Operation and maintenance office
- Warehouses
- Sanitation facilities

- Solid waste storage facilities
- Security system

2.3.3 Associated Facilities

Associated facilities refer to concomitant facilities, which are planned as part of the project but not covered by lender financing, without which the project would not be viable.

2.3.3.1 Loop-In-Loop-Out Connection

From the collector sub-station, a total of two 220 kV outgoing transmission lines, which will measure a length of 200metres. The LILO connection will be linked to the existing 220 kV Overhead Transmission Line (OTL) extending along the southern bounds of the PV plant and collector sub-station plot. The installation of the LILO OTL and its operation will be undertaken by NEGU, as set out in Project's PPA.

2.3.3.2 Infiltration Channels and Ponds

As described in Section 3.1.1, the overall area designated for the establishment of the PV plant site is currently utilized by Uzsuvtaminot, and a number of water supply facilities are distributed across the site. Consultations with Uzsuvtaminot indicated that the water supply facilities were developed around 1955, and some of the infrastructure is in disuse due to prolonged dilapidation. This infrastructure includes a total of 28 retention and infiltration ponds, most of which are dysfunctional.

In consideration of this, Uzsuvtaminot recommended mutually beneficial drainage (and groundwater recharge) initiatives, which would entail the rehabilitation and development of drainage facilities as follows:

- Rehabilitation and extension of the existing infiltration channels across the site, such that a total of four main infiltration channels will be upgraded for continued operation. The channels would continue to aid groundwater recharge with water channelled by the feeder canals.
- Rehabilitation of two existing infiltration ponds, and the development of an additional two retention and infiltration ponds. The new and revamped ponds will likewise enhance surface water capture within the groundwater intake zone.

The construction and rehabilitation of the water supply facilities will be carried out by the EPC Contractor in collaboration with the Uzsuvtaminot engineering team. Nevertheless, the operation and maintenance of these facilities will rest entirely with Uzsuvtaminot.

2.4 Construction Activities, Resources and Waste

2.4.1 Construction activities

The Project's construction phase will entail the following main activities:

- Mobilization and early construction works
- Civil works
- Electrical and mechanical works
- Demobilization

2.4.2 Construction equipment

The following table provides a preliminary overview of equipment that will be used to perform various construction activities and operations:

The main equipment to be employed for construction activities includes excavators, bulldozers, mobile cranes, forklifts, trucks, trenchers, compactors, welding machines, and power generators, among others.

Summary counts for the anticipated construction equipment are provided in Table 2-2 below. The list is notably not exhaustive.

Table 2-2 Provisional inventory of construction equipment

BATTERY UNITS	TOTAL NUMBER
Bulldozer	2
Excavator	2
Mobile crane	2
Truck	2
Truck-mounted drill rig	6

2.4.3 Construction materials and waste

The planned construction activities will require a host of raw materials, that will be delivered to the PV plant and BESS sites and reserved within on-site storage facilities such as laydown areas and warehouses. Construction work will also generate various streams of liquid and solid refuse, which will require temporary and controlled on-site storage, prior to handover to licensed contractors for disposal and/or recycling at designated sites.

Table 2-3 provides a listing of various construction raw materials, which will be generated during the Project's construction phase. Detailed estimates for these materials were not available at the time of writing.

Table 2-3 Estimated quantities of raw construction materials

MATERIAL	QUANTITY
Water	84,503 m^3 per year
Concrete	20,000 tonnes
Steel	5,000 tonnes
Fuel (for generator and motorized machinery)	1.2 million litres

An overview of construction-phase waste materials and their respective estimated quantities is provided in Table 2-4 below.

Table 2-4 Estimated quantities of construction waste

MATERIAL	QUANTITY
Sewage	1,693 m^3 per year
Solid waste	600 tonnes

2.4.4 Power demand

Construction works for the development of the PV plant and BESS will demand an average 132,666 KWh of electricity per month. Electricity for construction works on the PV plant site will be sourced from the auxiliary power system utilized by Uzsuvtaminot. On the BESS site, an on-site diesel generator will be used for power generation.

2.4.5 Construction workforce

The Project Company established for the project implementation currently employs a total of 23 employees, 11 of whom are Uzbekistan nationals.

The EPC Contractor appointed for projection construction works is China Energy Engineering Corporation (CEEC). The construction workforce will comprise skilled and semi-skilled labour, with a peak total of 700 workers. A sizeable fraction of the contracted workforce will be Chinese based, however recruitment for readily available specialists and blue-collar occupations will be reserved for Uzbekistan nationals and residents of the Project's affected communities, to the extent feasible.

Beyond contracted labour, the Project will engage supply chain workers employed in the extraction and manufacture of raw materials associated with the manufacture of the PV plant, sub-station and BESS components. The apex supplier engaged by the EPC Contractor for the delivery of solar panels is JA Solar.

2.5 Operation and Maintenance Activities, Resources and Waste

2.5.1 Operational activities

The following Operation and Maintenance (O&M) activities will be carried out over the course of the Project's operational lifetime:

- Commissioning and Plant Handover
- Scheduled/ preventative maintenance
- Scheduled/ preventative maintenance
- Unscheduled/ corrective maintenance
- Performance monitoring, production forecasting and reporting

2.5.2 Operational equipment

Table 2-5 below provides a preliminary overview of equipment that will be used to perform various operation-phase activities and operations within the PV plant, sub-station and BESS facilities, and their respective counts.

Table 2-5 Provisional inventory of operational equipment

BATTERY UNITS	TOTAL NUMBER
Automated dry-cleaning robots	One per array
Miscellaneous spare equipment parts/ devices (i.e., batteries, fuses etc.).	Supply on demand

2.5.3 Operational materials and waste

Materials required for planned operation and maintenance activities will be delivered to PV plant and BESS sites upon demand and reserved within the on-site warehouses. These materials will include water for sanitary and other maintenance activities. Operation and maintenance will also generate various streams of liquid and solid refuse, which will require temporary and controlled on-site storage, prior to handover to licensed contractors for disposal and/or recycling at designated sites.

Operations-phase waste materials will include:

- Electronic waste
- Spent oils
- Domestic solid refuse from site offices
- Domestic wastewater/ sewage

2.5.4 Power demand

Auxiliary power supply is required to operate inverter control circuitry, transformer magnetizing circuitry, cooling fan, air conditioner, lights, computers, server and lighting. During the daytime, generated yield will provide auxiliary power, whereas during the night-time or downtime, power will be imported from the grid.

2.5.5 Operational workforce

The Project's operational workforce will include a full-time workforce of 13 personnel. In addition, a total of 20-25 specialist staff may be deployed for major maintenance activities.

NOMAC Maintenance Energy Services is the main O&M Contractor appointed for O&M support under the Project Company.

2.6 Project Milestones

The following pre-feasibility and feasibility studies, have been completed for the Project:

- Remote and on-site solar resource assessment
- Topographic survey
- Geotechnical survey
- Hydrological survey
- Commercial modelling

The Government of Uzbekistan commissioned the solar resource assessment in March 2023, and the study was undertaken by The Project Developer. Following the execution of the PPA, the Project Developer assigned Juru Limited and UzAssystem to undertake the engineering related feasibility surveys, in preparation for detailed design and construction.

The Project is currently in its development and detailed design phase, which involves the completion of engineering designs, agreements with the appointed EPC Contractor and supplier, acquisition of various permits from competent authorities, and access to project financing.

Table 2-6 below provides and overview of the tentative schedule for subsequent stages of project implementation.

Table 2-6 Milestones for project implementation

IMPLEMENTATION PHASE	COMMENCEMENT DATE
Mobilization and early works	July 2023
Main construction works	September 2023

IMPLEMENTATION PHASE	COMMENCEMENT DATE
Commissioning	December 2023 (for 100MW PV Sub-Plant 1) April 2024 (for 100MW PV Sub-Plant 2) September 2025 (for BESS Plant);
Operations	December 2025

3 LAND-USE CONTEXT AND KEY E&S RECEPTORS

3.1 Existing Land-Use and Land Acquisition

A total of two land parcels will be acquired for the development of the Project's temporary and permanent facilities. The hectarage of these plots is outlined in Table 3-1, and information on the tenure and current use of the land is presented further below.

Table 3-1 Overview of the land take for the project facilities

PROJECT SITE	SIZE (HA)
PV plant and collector sub-station	655
BESS facility	16

An additional area of land will be acquired on an easement basis, for the development of a 220 kV OTL and an underground interconnection cable, which measure a total length of 200 metres and 1.56 kilometres respectively.

3.1.1 PV plant and sub-station site

3.1.1.1 Land ownership

The plot of land designated for the development of the PV plant facilities, including the collector sub-station is under the ownership of the Joint Stock Company (JSC) Uzsuvtaminot, which is a utility company providing water supply and sewerage services within Tashkent Region.

3.1.1.2 Land use

Sections of the land within the PV plant site are currently utilized for surface water treatment, groundwater recharge and the abstraction of groundwater, for potable water supply to service areas within Tashkent region. The site is understood has been utilized for water supply since 1955 and caters to about a third of the population of Tashkent City.

On 28th April 2023, a joint meeting and site visit was held between the representatives from Project developer, Uzsuvtaminot and the hydrological survey team from Juru Limited. Subsequently, Uzsuvtaminot issued an inventory of the water supply facilities resident within the site, as well as regulatory source protection zones (buffers) for each category of operational facilities. Due to its sensitivity, exhaustive information on the utility assets was not disclosed for the purposes of the ESIA study. Nevertheless, ESIA-stage consultations with local engineers from Uzsuvtaminot indicated that the main resident facilities include the following:

- A concrete fence running along the northern, eastern and southern perimeter of the site. The entry gate and access road to the site is located along the eastern side of the site, which is located close to the 4R-12 highway.
- Administrative buildings, sanitary facilities and guard posts.
- A total of 63 groundwater wells, of which 48 are operational and 15 are on standby.
- One feeder canal channelling water from an upstream section Chrichik River.
- A total of 28 retention ponds, most of which are dilapidated and out of use.
- A number of water infiltration channels.
- Pumping stations and pipework.
- Auxiliary assets, including internal water distribution pipes and electrical cables.

The consultations further indicated that Uzsuvtaminot has arranged for severely degraded facilities (in disuse) and has sought the Project developer's assistance in the upgrade of a few existing facilities, and the establishment of several new infiltration ponds and channels.

The perimeter of the site is fenced on all fronts, except the western boundary, which is situated nearby Chirchik River. Access to the site is strictly prohibited, and security personnel are stationed across the area. No other land usages were observed within the site, and no private property is located in the area.

Figure 3-1 Uzsuvtaminot administrative offices (left) and pump station (right)within the PV plant site

The main land-uses noted within 500 meters of the site boundaries include commercial establishments located along the southern and south-western bounds, the 4R-12 highway east of the site, a cluster of aquacultural ponds located a distance away from the northern boundary, an underground gas pipeline north of the site, and an existing 200kV OTL running the southern and south-western boundaries.

Figure 3-2 Existing OTL within the PV plant site (left) and Chirchik River close to the site (right)

3.1.2 BESS site

3.1.2.1 Land ownership

Prior to the commencement of the Project, land within the BESS site was placed under the ownership of the Cultural Heritage Agency (CHA) of Uzbekistan, as part of a wider tract measuring a total area of 179 hectares. However, following the issue of the Presidential Resolution to provide for the Project, the Cultural Heritage Agency returned the undeveloped land to the land reserves of the Tashkent Regional Khokimiyat (administration), following the completion of a pre-construction archaeological survey to confirm the absence of any tangible cultural heritage resources within the area.

3.1.2.2 Land use

The site designated for the establishment of the BESS is undeveloped, and no farmland, built-up structures, utility assets or water sources are present within the area. Site visits and consultations with local authorities and community leadership indicated that the BESS site is occasionally utilized for herding, albeit to a limited extent as the area does not offer abundant pastures (as compared to the nearby expanse).

Figure 3-3 Pasture field within the BESS site (left) and the existing sub-station south-west of the area (right)

A large portion of the landscape surrounding the BESS site is utilized for grazing, and herds of cattle were encountered during field reconnaissance. A patchwork of actively farmed land extends across the middle section, western, eastern, and southern extremities of the surrounding area. Agricultural production sighted nearby the site includes the cultivation of wheat, apple trees and plum trees.

Figure 3-4 Fallow land and fruit tree orchards within areas surrounding the BESS site

3.2 Identification of E&S Impact Receptors

A preliminary identification of potential E&S receptors (i.e., Valued Environmental Components) located within 3 kilometres of the PV plant and BESS plot boundaries was carried out based on the examination of satellite imagery, early site visits, and progressive consultations with key stakeholders. The general Area of Influence (AoI) was set to 3 km considering the maximum AoI, which is expected for the majority of potential direct impacts associated with the main project facilities.

The land-uses and potential E&S receptors around the PV plant are shown in the figure below.

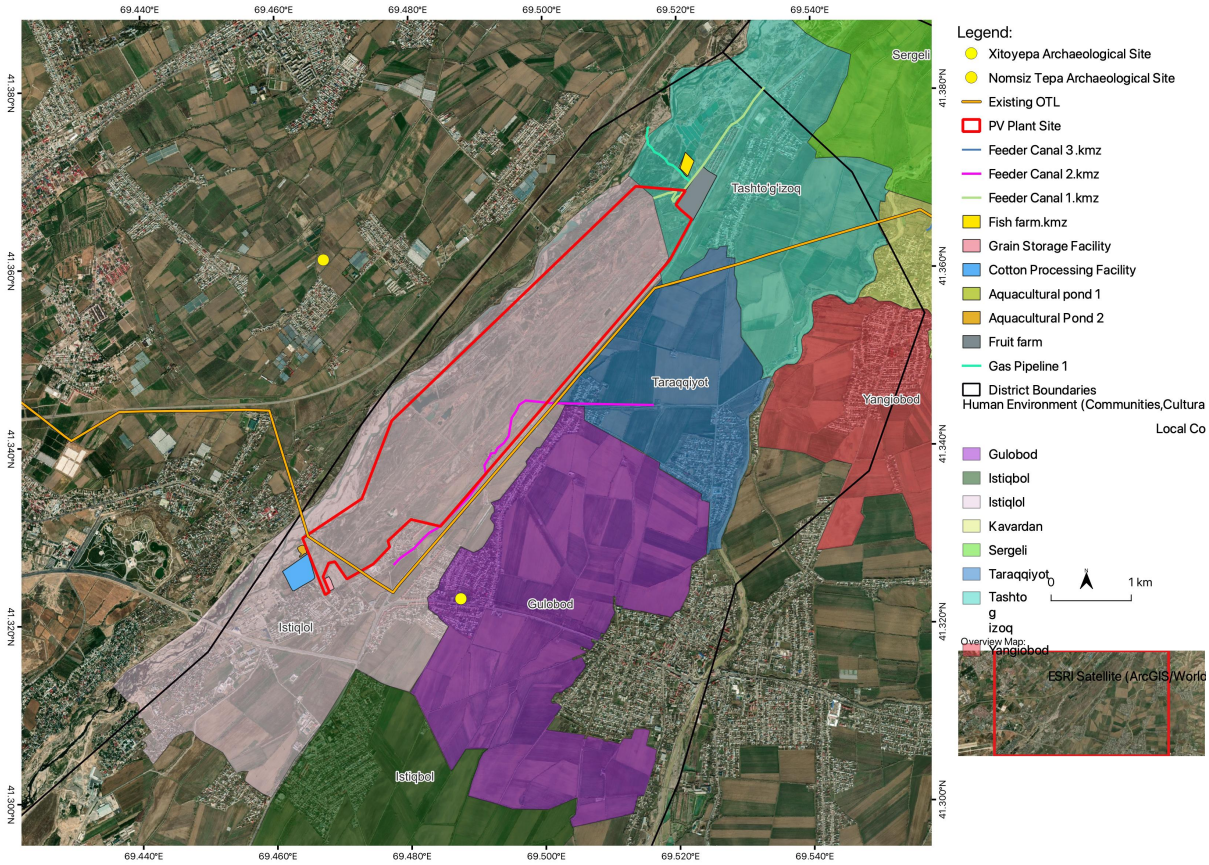

Figure 3-5 Overview of potential E&S impact receptors within 3 kilometres of the PV plant site

Table 3-2 below provides further information on the E&S receptors identified within the general AoI of the PV plant site, with respective summary descriptions and locations relative to the boundaries of the project footprints.

Table 3-2 Overview of potential E&S impact receptors within 3 kilometres of the PV plant plot boundaries

Receptor Type	Proximity to Project Sites	Description
Uzsuvtaminot water supply facilities	Within the project site	Boreholes, piping, pumping stations, infiltration channels and retention ponds, electrical cabling, administrative buildings and sanitary facilities operated by Uzsuvtaminot.
Chirchik River	100 metres west	Chirchik River channel located an average of 100 meters from the western site boundary.
Feeder canal 1	Within the project site	Feeder canal channelling water from an upstream section of Chirchik River.
Feeder canal 2	Within the project site	Feeder canal channelling water from Karasu River, which stems from an upstream section of Chirchik River.

Receptor Type	Proximity to Project Sites	Description
Aquacultural pond	200 metres north	Cluster of fish farming ponds, with the nearest pond located north of site boundary.
Istiqlol residential community (with commercial complex)	Immediate south	Residential community adjoining the southern site boundary, with the nearest zone featuring a commercial complex.
Tashto'g'izoq residential community	Immediate north	Residential community adjoining the northern site boundary, with the nearest zone featuring a cluster of fish farms.
Taraqqiyot residential community	100 metres east	Residential community located east of the site boundary, including extensive farmland.
Gulobod residential community	300 metres east	Residential community located east of the site boundary, including extensive farmland.
Istiqbol residential community	1 kilometre south-east	Residential community located south-east of the site boundary, including extensive farmland.
Yangiobod residential community	2 kilometres east	Residential community located east of the site boundary, including extensive farmland.
Kavardan residential community	2.5 kilometres north-east	Residential community located north-east of the site boundary, including extensive farmland.
Sergeli residential community	1.7 kilometres north of the site	Residential community located north of the site boundary.
4R-12 highway	50 metres east	A paved road connecting the district to the main radial and outer ring roads of Tashkent City.
Gas pipeline 1	122 metres north	Yangiyor-Tashkent gas pipeline, with a length of 201 km, depth of 0.8m to 1.5m below ground level and a diameter 1220mm.
220kv OTL	Within the project site	An existing OTL intersecting the southern portion of the site and running along the western boundary of the site.
Xitoytepa cultural heritage site	0.9 kilometres east of the site	A cultural heritage exploration area east of the site.
Nomsiz Tepa cultural heritage site	2 kilometres west of the site.	A cultural heritage exploration area west of the site.
Fish farm	100 metres south-west of the site	An aquaculture recreational site under construction.
Fruit garden	Immediately north-east of the site	Strawberry farm

The land-uses and potential E&S receptors around the BESS are shown in the figure overleaf.

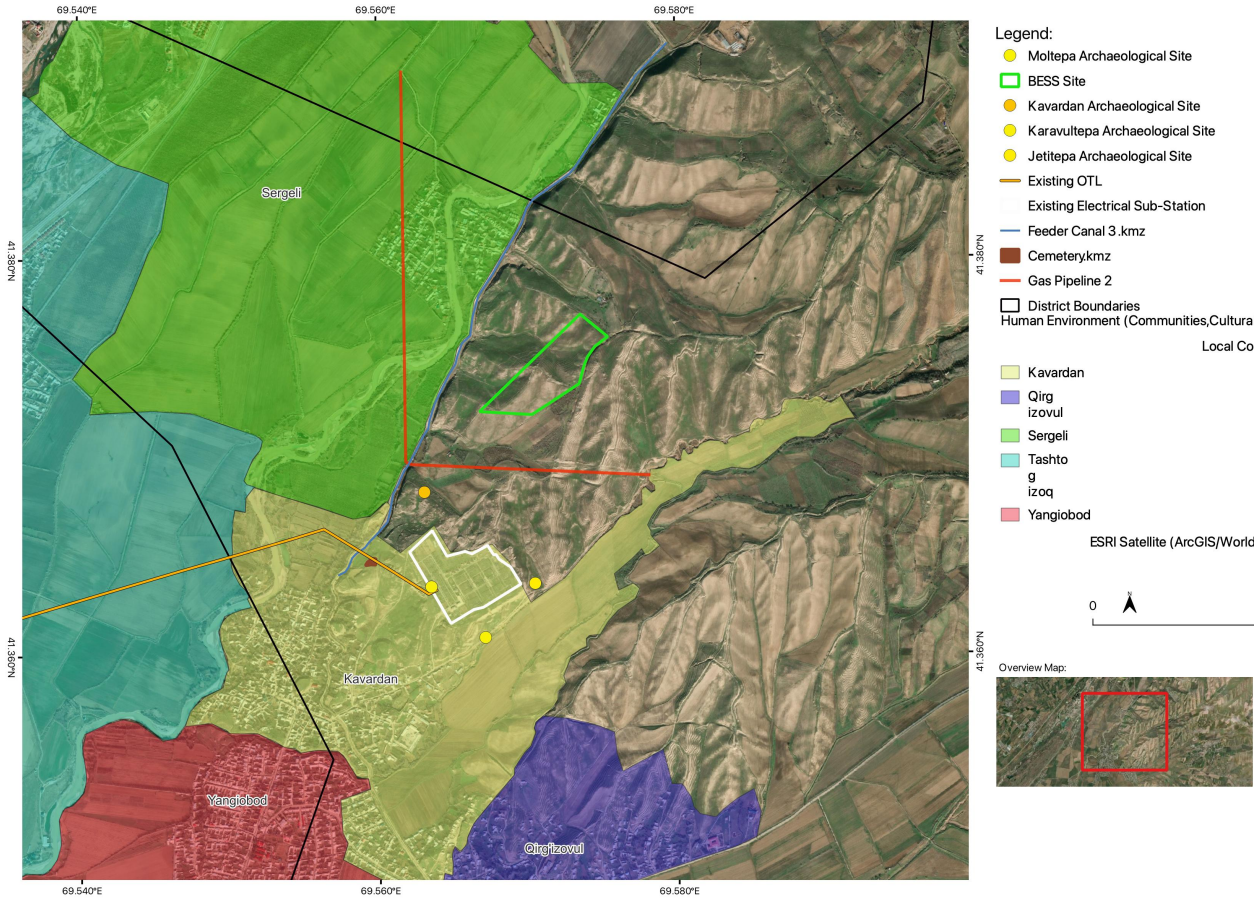

Figure 3-6 Overview of potential E&S impact receptors within 3 kilometres of the PV plant site

Table 3-3 below below provides further information on the E&S receptors identified within the general AoI of the BESS site, with respective summary descriptions and locations relative to the boundaries of the project footprints.

Table 3-3 Overview of potential E&S impact receptors within 3 kilometres of the BESS plot boundaries

Receptor Type	Proximity to Project Sites	Description
Karasu River	362 metres west	Main canal stemming from Chirchik River.
Khandam Canal	245 metres west	Irrigation channel stemming from Karasu River.
Residential plot 1	140 metres north-east	Residential facility (to be confirmed) located north-east of the site.
Residential plot 2	264 metres south-west	Residential facility located south-west of the site.
Tashto'g'izoq residential community	1.2 kilometres west	Residential community west of the site.

Receptor Type	Proximity to Project Sites	Description
Yangiobod residential community	2.1 kilometres south-west	Residential community located south-west of the site boundary, including extensive farmland.
Kavardan residential community	885 metres to the south and east	Residential community located east and south of the site boundary, including extensive farmland.
Sergeli residential community	300 metres west	Residential community located west of the site boundary.
Qirg'izovul residential community	1.8 kilometres south-east	Residential community located south-east of the site boundary, including extensive farmland.
4R-12 highway	2.4 kilometres west	A paved road connecting the district to the main radial and outer ring roads of Tashkent City.
Gas pipeline 2	300 metres to the west and south	Syrdaryo-Tashgres gas pipeline, with a length 198 km, depth of 0.8m to 1.5m and diameter of 1020mm.
220kv OTL	1 kilometre south	An existing OTL connecting to the nearby sub-station.
Existing sub-station	600 metres south-west	An existing sub-station located south-west of the site.
Cemetery	990 metres south-west	A communal cemetery located south-west of the site.
Kavardan Cultural Heritage Site	540 metres south-west	A cultural heritage exploration area south-west of the site.

3.3 Land Acquisition Process

3.3.1 Power Purchase Agreement

On 19 March 2023, the National Electric Grid of Uzbekistan (NEGU) JSC executed a Power Purchase Agreement (PPA) with the Project Developer and Project Company. The agreement requires the Project Company to construct the PV power plant, BESS, and underground interconnection powerline. According to the PPA, following the construction of these facilities, the Project Company will be responsible for the operation and maintenance of the PV power plant and BESS facilities for power supply to the national grid over a period of 25 years.

3.3.2 Presidential Resolution

On 14 June 2023, the Presidential Resolution No. PQ-189 on Measures to Implement the Investment Project 'Construction Of 400 MW Solar Photovoltaic Power Plant And 334 MW Electricity Storage System in Yurkochirchik District of Tashkent Region' was established (see Annex 1). The Resolution mandates the Ministry of Investment, Industry and Trade (MIIT) and the State Assets Management Agency (SAMA) to allocate land plots for the development of the PV power plant and BESS within Yukorichirchik and Parkent Districts in Tashkent Region.

3.3.3 Transfer of Land Rights

In furtherance of the Presidential Resolution for the implementation of the Project, the following two decrees were issued by the Mayor of Tashkent Region, to transfer the ownership of targeted land parcels from Uzsuvtaminot JSC to the Ministry of Energy:

- On 11 July 2023, the decree no.317-10-0-Q/23 was established to mandate an application by Uzsuvtaminot JSC for the return of 460 hectares of residual (unoccupied) land parcels within the 'Kibray Water Facility Plot' to state reserves, pursuant with Provisions 6 and 25 of the Law on Local State Municipality (see Annex 2).
- On 17 July 2023, the decree no.335-10-0-Q/23 was established to mandate the transfer of the targeted land parcels from government reserves to the Ministry of Energy for the development and operation of the PV power plant and LILO see Annex 2).
- In August 2023, two additional decrees were established to mandate the return of 15.9 hectares of the targeted, undeveloped land parcels under the ownership of Cultural Heritage Agency to state reserves, and the subsequent acquisition of these land parcels by the Ministry of Energy for the development and operation of the BESS and underground interconnection cable.

3.3.3.1 PV power plant site

The third-party tenure within the plot of land partially allocated to the development of the PV power plant will continue on the basis of an effective land allotment order. This tenure will apply to all areas required for the continued operation and maintenance of the utility assets belonging to Uzsuvtaminot.

The parcels of residual land designated for the operation and maintenance of the project facilities will be held on the basis of a LLA between the Ministry of Energy and the Project Company, for the duration of the Project's operational phase. In addition, a tripartite easement agreement involving the Ministry of Energy, Project Company and Uzsuvtaminot will be established for additional areas of land held by Uzsuvtaminot, where ad-hoc access may be required for occasional maintenance purposes during operations.

Following the issue of the Presidential Decree, Uzsuvtaminot played a lead role in the delineation of residual (unused) land parcels for reallocation to the Project. Consultations with Uzsuvtaminot confirmed that the Project's construction and operational footprint will not impact upon any operational water supply facilities within the plot. No aspect of the utility facilities, water supply services or labour will be curtailed by the Project. The consultations also indicated that another operational water extraction zone managed by the utility is situated about 300 metres west of the site, across Chirchik River, and no expansion plans were developed prior to the Project.

Further, early engagement with Uzsuvtaminot involved the demarcation of protective buffer zones for all resident water supply facilities, to avoid contingent contamination of soil and ambient water resources close to boreholes and accidental damage to utility assets, during construction. At the national EIA stage (preceding the bankable ESIA study), the Ministry of Ecology, Environmental Protection and Climate Change (MEEPCC) also prescribed a riparian buffer of 60 metres for Chirchik River, which generally lies about 200 metres west of the project footprint. This buffer serves as both a sanitary setback to prevent sediment loading and the inflow of contaminated runoff, and leeway for any alluvial flood events and related erosion.

3.3.3.2 BESS and interconnection cable sites

Land within the BESS site was previously held by the Cultural Heritage Agency, however, no developments were undertaken within the site. Following the issue of the Presidential Decree for the Project, the Agency commissioned an archaeological survey to ascertain the absence of any tangible heritage resources within the site prior to the handover of land. Consultations with the Agency established that no archaeological finds were noted in the survey, and that the project footprint does not fall within any protective buffers for designated cultural heritage sites or objects.

The Project Company will also enter into a separate LLA with the Ministry of Energy, for ownership of the BESS site, for the duration of the Project's operational term.

4 STAKEHOLDER ENGAGEMENT

4.1 Stakeholder Engagement Objectives

Stakeholder engagement amongst the key requirements for the conduct of the Project's ESIA, under national law and the Project Lenders' E&S performance standards. According to these instruments, a meaningful and adaptive stakeholder engagement process which begins at reasonably early stages of project planning and continues throughout subsequent stages of project implementation, is intended to fulfil the following E&S performance objectives:

- To establish a participatory, informative and transparent dialogue with parties with the potential to influence the project and/or become affected by the project, as well as constituencies with an interest in the outcome of the project.
- To leverage and integrate local and expert knowledge in the identification and assessment of E&S impacts, subsequent optimization of the project design and effective mitigation planning.
- To establish community buy-in and ensure the delivery of sustainable project benefits to targeted beneficiaries.

Stakeholder engagement is a 'live' process that must be organized by means of a dedicated and documented Stakeholder Engagement Plan (SEP). The SEP developed at the bankable ESIA stage was built upon the rounds of stakeholder engagement discharged as part of the national EIA process. The basis for the preparation of the project SEP and an overview of the SEP commitments are detailed below.

4.2 Stakeholder mapping and categorization

The preparation of the Stakeholder Engagement Plan (SEP) commenced with a stakeholder mapping exercise. The wide range of stakeholders associated with the Project were identified and classified based on the review of the Project's legal framework and the preliminary identification of E&S impact receptors by means of desktop research and field reconnaissance. In terms of administrative capacity, the project stakeholders were classified as follows:

1. Project-affected landowners and land users.
2. Project-Affected Communities (PACs).
3. Local Government Authorities ((LGAs) i.e., regional and district administration).
4. National Ministries, Departments, and Agencies (MDAs).
5. Non-Governmental Organizations (NGOs).

4.3 Stakeholder Engagement Methods

The modes of stakeholder engagement used at the ESIA stage include formal consultative letters/ correspondence, community meetings, leaflets and infographics, household surveys, Focus Group Discussions (FGDs), Key Informant Interviews (KIIs), participatory site visits, official announcements and media coverage, local and online disclosure of E&S safeguard documents. These consultation and disclosure methods were applied differentially, depending on the stakeholders' relevance to the Project, respective communication agenda, and the progress of engagement.

Following the stakeholder analysis and the selection of suitable engagement modes, a forward Stakeholder Engagement Plan (SEP) was drawn up to ensure that the scope,, frequency and differential means of engagement are commensurate with the role and relevance of each stakeholder group.

The above-described modes of stakeholder engagement will continue to be conducted in a manner that is culturally appropriate, understandable to target audiences, and free of manipulation, coercion, and intimidation. The timing and location of community meetings and FGDs were previously organized with efforts to ensure sufficient and equitable representation of groupings or constituencies whose attendance may be constrained by a lack of mobile communication, transportation means and overriding workplace or domestic commitments. Oral and written communication has been made in local languages, namely Uzbek and Russian, as appropriate. All modes of engagement have been documented by minutes of meetings and attendance and/or document dispatch logs, as relevant.

4.4 Stakeholder Inputs for ESIA

The stakeholder inputs from various relevant parties are summarized below. Volume II of the ESIA report and the project SEP provide a detailed description of the comments, concerns and feedback raised by the stakeholder groups informed about the Project and consulted over the course of the Project's ESIA process.

- Local communities requested for details on the project developers, the planned construction timeline, and information on the design, function, and hazards of the project components (i.e., PV power plant and BESS, interconnection facilities).
- Kavardan community residents expressed concern over possible harmful impacts of the BESS facility on human health. Clarification was provided in response, to assure the communities about the limited intensity and extent of Electromagnetic Fields associated with the BESS components, and the isolation of electrical equipment and interconnection facilities.

- Local communities requested for consideration of community development initiatives such as extension of employment opportunities to local community members, rehabilitation of local roads, development of irrigation infrastructure and support with off-grid power facilities for local households.
- Uzsuvtaminot provided limited (classified) information on the inventory and distribution of water supply facilities within the PV power plant site, which are currently operational as part of the water supply system provisioning water for service areas in Tashkent Region. Sanitary buffers were prescribed for these facilities.
- The MEEPCC provided technical conditions as part of the positive conclusion on the Stage I national EIA reports submitted to the regulator, which include the requirement for the relocation and/or replanting of certain trees originally present within the PV power plant site, and the observation of a sanitary and erosion buffer (setback) around Chirchik River. The Ministry also provided information of suitable facilities for the management of general and hazardous construction waste.
- Uztransgaz provided information on operational gas pipelines present nearby the project sites, and compulsory technical conditions which must be followed by the EPC Contractor prior to and during earthworks and electrical works for the installation of the underground interconnection cable. The cable will be set up above an existing, operation Category I gas pipeline. The conditions must be adhered to in full, to avoid H&S impacts and property damage.
- The Committee for Public Health prescribed a Health Protection Zone (HPZ) of 150 metres for the BESS site, where residential facilities and occupied workplaces must not be established in the future.
- The Cultural Heritage Agency and Institute of Archaeology provided a statement to indicate the outcome of pre-construction archaeological survey for the greenfield development of the BESS facility. These authorities also provided a directive requiring a watching brief (i.e., technical supervision) for earthworks within the BESS site during construction. Information on the location of designated archaeological sites located within 1 kilometre of the BESS was also provided.
- Various line departments constituting the khokimiyats for Yuqorichirchik District and Parkent District, as well those constituting the overarching khokimiyat for Tashkent Region provided miscellaneous information concerning the usage and ownership of land parcels in and around the project sites, as well as information on social services, livelihoods, and general guidance regarding E&S issues.

4.5 Grievance Redress Mechanism

In accordance with lender-prescribed E&S requirements, including the EBRD PR10 and the IFC PS 1, an external GRM has been developed, to enable the timely identification and resolution of grievances and concerns from project stakeholders and the project-affected communities. Local communities based around the project sites have been familiarized with the Project's community GRM to enable the collection of grievances on platforms that are accessible to all

constituencies and free of manipulation, interference, intimidation, service charges and restrictions on arbitration, judicial recourse, and choice of confidentiality.

The GRM will allow for the delivery of oral and/or written grievance by aggrieved entities. Reporting channels for external grievances will include:

- General consultation forums (i.e., community assemblies, FGDs, KIIs).
- Phone calls.
- Email correspondence.
- Grievance box at entry points to project sites.
- Written/ oral delivery to project personnel, including CLOs and security personnel (security personnel at the Project's entry points and site office(s) must be aware and trained to deal with any grievances appropriately).

Table 4-1 Grievance management process, actors and timeline

STAGE	TIMELINE
Grievance is received/submitted	-
Grievance is logged and acknowledged	Within 7 working days of grievance being submitted
Grievance is investigated	Within 14 working days of grievance being submitted
Proposed resolution conveyed to grievant	Within 14 working days of grievance being submitted
If applicable following dissatisfaction of resolution by Grievant	
Actions to re-assess grievance/propose new solution/inform Grievant of final decision	Within 14 working days of notification of dissatisfaction by Grievant
In the event that a grievance cannot be resolved between the two parties a mediator will be involved i.e. local leaders who understand the culture and practices within the Project site.	Within 14 working days of notification of dissatisfaction by the Grievant.
The LRP Committee will be invoked, for ultimate extrajudicial recourse for grievances related to livelihood impacts. **Note 1:** The intended objectives and constitution of the LRP Committee are provided in the SEP.	Within 30 working days of notification of dissatisfaction by the Grievant.
Note 2: In the event that certain complexities result in protracted investigation and remedies, the Grievant will be informed of any such delays and advised on the updated timeline to response.	

5 SUMMARY OF ENVIRONMENTAL AND SOCIAL IMPACTS

5.1 Geology, Soils and Hydrology

BASELINE CONDITIONS

A geotechnical investigation of the PV power plant site revealed that the bedrock overburden largely comprises quaternary alluvial deposits deriving from the Syrdarya complex, which can be classified as sandy soils. All eight soil sampling locations within the PV plant site exhibit generally good soil quality, as exceedances of concentration thresholds specified in both national standards and internally recognized guidelines were only recorded for Nickel. Groundwater was encountered at depths ranging between 1.3 and 7.5 metres below ground level. Both groundwater sampling locations exhibit good groundwater quality, with no recorded exceedances in relation to local and internationally recognized standards for potable water.

A geotechnical investigation of the BESS site revealed that the bedrock overburden consists of quaternary deposits dominated by Holocene formations with a smaller representation of Middle Section formations, which can be classified as clayey silts or silty clays. Both soil sampling locations within the BESS site exhibit generally good soil quality, as exceedances of concentration thresholds specified in both national standards and internally recognized guidelines were only recorded for Nickel. Groundwater was not encountered on the site upon drilling to 15 metres below ground level.

Major drainage features within the PV power plant site include Chrichik River, which flows west of the site, and two feeder (irrigation) canals which stem from Chirchik River. Two water sampling locations within Chirchik River, and two additional sampling locations within the feeder canals exhibit generally good water quality, with no significant exceedances of concentration thresholds specified in both national standards and internally recognized guidelines. No seasonal or ephemeral drainage features were noted within the BESS and underground cable sites.

POTENTIAL IMPACTS – CONSTRUCTION PHASE

Potential impacts on geology, soils and hydrology in the Project's construction phase include soil erosion resulting various earth-moving activities as well the contamination of resident soil, groundwater, and surface water, due to littering and accidental spills and leakages of materials from construction machinery, plants, and storage facilities, including fuels, lubricants,

used oils, paints, solvents, and sewage. Potential contamination of the local aquifer represents a major negative impact, considering the on-site water abstraction and water supply system, which caters water to about a third of the population of Tashkent City. On the PV power plant site exclusively, construction-phase impacts further include sedimentation within nearby surface water bodies as a result of extensive soil erosion, as well as localized groundwater drawdown around on-site utility wells, in the event of intensive dewatering.

Potential Impacts – Operation Phase

The risk of contamination of resident soil, groundwater, and surface water, extends into the Project's operational phase, due to littering and accidental spills and leakages of materials, including fuels, lubricants, used oils and sewage from O&M machinery, plants and storage facilities, and leaching from electronic refuse.

Impact Avoidance and Mitigation Measures

Provided the avoidance and mitigation measures specified in the C-ESMP and O-ESMP are implemented, the significance of the above-mentioned potential impacts will be reduced to a minor status. General mitigation requirements involve the isolation and of hazardous and general soluble solid and liquid materials (including waste) within specialized storage facilities, and controlled excavation and stockpiling of soil to minimize the displacement of soil. Within the PV power plant site, additional measures to prevent the contamination of the resident aquifer and nearby Chirchik River include the maintenance of the prescribed sanitary buffers, prohibition of bulk on-site storage of construction chemicals and waste, and controlled refuelling at off-site locations or dedicated on-site areas with the use of spill trays.

A dedicated Water Management Plan, Soil and Erosion Management Plan, Waste Management Plan, Hazardous Materials and Waste Management Plan, Pollution Prevention and Control Plan, Emergency Preparedness and Response Plan, and Site Rehabilitation Plan will be developed to manage relevant impacts on geology, soils, and hydrology.

5.2 Solid Waste and Wastewater

Baseline Conditions

The nearest available facilities for the treatment of residential waste from the Project's construction and operational phases include (i) Bulokboshi Landfill located in Yukorichirchik District, (ii) Samsarak Landfill located in Parkent District, and (iii) Chotkal Landfill located in Maydontol. Engineered landfills for the management of industrial and hazardous waste include (i) Tuzel Landfill located in Kibray District, and (ii) Yegizbulok Landfill located in Forish District of Jizzakh Region. No facilities for the centralized treatment of domestic and industrial

wastewater exist within the project-affected districts, however wastewater treatment plants (WTPs) within the broader Tashkent Region include the Southern Wastewater Treatment Plant (WWTP), Chirchik WWTP, Angren WWP, Almalyk WWTP, and Bekabad WWTP.

Potential Impacts – Construction Phase

Potential impacts related to waste and wastewater in the Project's construction phase include (i) contamination of resident soil, groundwater, and surface water, due to littering and accidental spills and leakages of materials from construction machinery, plants, and storage facilities, (ii) adverse impacts on human health resulting from contamination of ambient soil and water and/ or direct exposure to hazardous construction waste (including medical waste), (iii) degradation of air quality due to offensive odours from putrescible construction waste streams, (iv) as well as increased pressure on local waste management facilities.

Potential Impacts – Operation Phase

Potential adverse impacts on ambient soil, water, and human health from the generation of waste, extends into the Project's operational phase, due to accidental spills and leakages of materials, including fuels, lubricants, used oils and sewage from O&M machinery, plants and storage facilities, and leaching from electronic refuse.

Impact Avoidance and Mitigation Measures

Provided the avoidance and mitigation measures specified in the C-ESMP and O-ESMP are implemented, the significance of the above-mentioned potential impacts will be reduced to a minor status. General mitigation requirements involve the isolation and of hazardous and general soluble solid and liquid materials (including waste) within specialized storage facilities, the engagement of licensed waste collection and management contractors for waste management services and monitoring to ensure that all hazardous waste streams generated by the project are delivered to engineered landfills, industrial wastewater treatment plants, and any other specialized facilities (e.g., incinerators) for the safe and sanitary management of such waste.

A dedicated Water Management Plan, Waste Management Plan, Hazardous Materials and Waste Management Plan, and Emergency Preparedness and Response Plan will be developed to manage impacts related to the generation of waste and wastewater.

5.3 Terrestrial and Aquatic Ecology

BASELINE CONDITIONS

The baseline conditions relating to terrestrial and aquatic ecology in and around the project sites were defined by means of specialized baseline surveys for various taxa (including literature review, field studies and stakeholder consultation), and a simultaneous Critical Habitat Assessment (CHA) study aimed at identifying habitats of conservation concern.

5.3.1 Habitats

The field studies were conducted in 2023/06/01 for the PV site and at 2023/07/22 for the BESS site; and these were conducted with traditional methods of botanical survey commonly used for sampling and mapping of native non-forest vegetation, recognition of floristic composition and spatial patterns of plant communities (Field geobotany, 1959–1976; Granitov, 1980; Kent, 2011). Habitats within the PV power plant site include riparian scrub, natural riverine habitat and modified wetlands, fallow lands, wastelands, roadsides and boundary-strips, gardens and woodland belts, irrigation / drainage channels, as well as buildings and roads. Habitat types within the BESS and underground cable sites include dry grassland, fallow land, and gardens. Potentially affected habitats within the project sites can be classed as modified habitats due to extensive historical disturbance and the presence of non-native species.

5.3.2 Flora

A total of 90 plant species of 27 families (77 native, 10 alien and 4 introduced agricultural crops or ornamental trees) were recorded in the PV power plant site, while a total of 57 plant species of 17 families (47 native, 7 alien, and 3 introduced cultivated species) were recorded within BESS site and along the underground cable line. No restricted-range endemics or threatened plants included in the IUCN Red List (CR, EN, VU categories) or Red Data Book of Uzbekistan were found within the study area.

5.3.3 Birds

The project sites are collectively situated within the convergence of the Central Asian Flyway and the West Asian/East African Flyway, and within 100 km of four Important Bird Areas (IBAs) the nearest of which is located 35 km east of the project sites. Two rounds of bird monitoring were conducted within the project sites in the Spring (May-June) and Autumn (September – October), using transects and regular point counts and Vantage Point (VP) surveys respectively.

The Autumn-time survey included detailed observations for bird migration within two VPs nearby the PV plant site and two VPs within the BESS and underground cable site, with a total watch time of 28 hours at each VP. Due to the progress of early works within the site, the VPs for the PV plant site were located within the Ecologically Appropriate Area of Analysis (EAAA) immediately north-west of the site boundary where conditions are representative of original on-site habitats.

A total of 27 and 95 bird species were recorded within the PV power plant site and BESS sites in the spring and autumn respectively. No birds of conservation concern were found to utilize the on-site habitats, except for the European turtle dove (*Streptopelia turtur*), for which only one sighting was recorded in the PV power plant site in the spring season. This conservation status of the species on the IUCN Red List and the Redbook of Uzbekistan is Vulnerable (VU), and it is therefore considered a Priority Biodiversity Feature, as per criteria listed in the EBRD Performance Requirement 6 (EBRD PR 6) standard.

5.3.4 Bats

Active acoustic detectors (Wildlife Acoustics Echo Meter Touch) were deployed to capture echolocation data over time on 31/07/2023 and 01-02/08/2023. The methods of deployment consisted of one transect. The transects passed along the route of the boundary of the PV site, with stops at every 500 m. Each stop included five minutes of active recording for bats. The recorders were not kept on between stops, and in total it recorded between the hours of 21:00 and 23:30. Bat calls parameters known for European bat populations (Barataud, 2015) and bat species from neighbouring countries for Uzbekistan (Benda et al., 2012) were used for identification and analysis.

Further, the possible location of bat roosts, which would be used by residential bats, maternity colonies, hibernating, bats and for mating, is of importance to understand. Specialized bat roost searches were undertaken within the PV project boundaries and area of influence. These surveys were undertaken on July 26, 2023. When a roost was found, it was thoroughly examined, both for the presence of bats themselves, and for signs of their presence – excrement, food remains (insect wings, legs, etc.). All suitable bat habitat has been surveyed. Near the project area there are settlements with residential houses, which were not surveyed. No suitable roosting features were found within the BESS site during field reconnaissance and the habitat mapping survey, and therefore roost searches were not deemed necessary for the site.

Potential bat roosts in the studied region are anthropogenic, mainly buildings and wells. There are no grottoes, caves, and large trees with hollows or other natural roost types. The calls of 6 bat species were recorded in the site. The calls of the Common pipistrelle (*Pipistrellus*

pipistrellus) are dominant in the datasets (92%) with the second most common species being Serotine bat (*Eptesicus serotinus)* (3.8%). No species of conservation concern were identified within the study area.

5.3.5 Mammals

Rapid survey assessment was undertaken via visual inspection of the PV site on 1st June 2023 and the BESS site (including the underground cable route) on August 26, 2023. On the PV power plant site, low abundances of 17 mammalian species including bats, rodents and small predators such as the Red fox, Golden jackal and African wildcat, were recorded. On the BESS and underground cable sites, a total of 12 mammalian species including bats, rodents, shrews and small predators such as the Red fox and African wildcat. No species of conservation concern were identified within the study area.

5.3.6 Herptiles

Transect surveying was undertaken with the aim to identify herpetofauna and record abundances and density, within the PV power plant, BESS, and underground cable sites. The main research method used was mixed stationary and transect survey. Points and transects for conducting research were outlined at the project monitoring stations in accordance with different types of habitats. The surveys were conducted on the 07/06/2023 and 26/08/2023 for the PV power plant site, and BESS and underground cable sites respectively. One skink species was recorded within the PV plant site, and one toad, one skink and one gecko species were identified within the BESS and underground cable sites. While no species of conservation concern were recorded, the habitats found are deemed potentially suitable for two species with a Vulnerable (VU) conservation status on the Redbook of Uzbekistan, namely the Barred Wolf Snake and Meadow Viper.

5.3.7 Aquatic ecology

A rapid aquatic assessment including fish surveying of the river as well as the channels running through the site was undertaken on October 7-8, 2023. Ichthyological samples were collected using a set of stake nets with a length of 70 meters and a mesh size of 10 millimetres, gillnets (10 meters in length and 1.5 meters in height), as well as fish traps that were set up in the Chirchik River and its channels.

A total of five fish species were recorded within Chirchik River, one species was recorded within Canal 1 (northern feeder canal), and one species was found within the BAF canal. None of the species are of conservation concern, except for the Tashkent riffle bleak (*Alburnus oblongus*) found in Canal 1, which is classed as Vulnerable (VU) in the Redbook of Uzbekistan.

POTENTIAL IMPACTS – CONSTRUCTION PHASE

Potential impacts on biodiversity in the Project's construction phase include habitat loss, direct mortality, take (i.e., poaching, hunting, and gathering), displacement/ dispersal, introduction of pathogens and invasive species, as well as displacement and population declines due to soil, water, air, noise, and light pollution from various construction activities.

POTENTIAL IMPACTS – OPERATION PHASE

Potential impacts on biodiversity in the Project's operation phase include bird and bat mortalities from 'lake effect' (i.e., collision with PV panels mistaken for water bodies), habitat fragmentation due to permanent fencing and edge effects, which may altogether contribute to the species reduced foraging, reproductive success, and survivorship within the project sites.

IMPACT AVOIDANCE AND MITIGATION MEASURES

Provided the avoidance and mitigation measures specified in the C-ESMP and O-ESMP (and supplementary biodiversity management plans) are implemented, the significance of the above-mentioned potential impacts will be reduced to a negligible to minor status. The main preventative mitigation requirements at the construction stage include micro-siting of project facilities to avoid important habitats (i.e., woody vegetation and riparian habitats), the restriction of construction works and site clearance to delineated construction zones, observation of protective buffers for Chirchik River and on-site feeder canals, prohibition of hunting, poaching and harvesting and the uncontrolled use of herbicides and pesticides, restriction of speed for project vehicles, implementation of a Biodiversity Chance Find Procedure, various measures for abating water, soil, noise, air and light pollution, as well as site inspections to identify any establishment of invasive floral species.

During operations, bird and bat fatality monitoring efforts within the PV plant site will be undertaken to determine whether any mortality impacts arise as a result of the 'lake effect'.

5.4 Noise and Vibration

BASELINE CONDITIONS

A total of three monitoring locations were considered representative of baseline noise levels at noise-sensitive establishments located within 300 metres of the PV plant site and the site entry point. The establishments include (i) a residence located 156 metres from the eastern PV plant site boundary, (ii) industrial facility located 42 metres from the eastern PV plant site boundary, and (iii) a residence located 28 metres from the eastern PV plant site boundary. One monitoring location was considered representative of baseline noise levels at noise-

sensitive establishments located within 300 metres of the BESS site. This establishment can be described as a Residence located 140 metres from the north-eastern BESS site boundary.

Baseline ambient noise monitoring was undertaken using a Class 1 noise level meter (Rion NL 52). The noise meters were mounted on tripods such that the microphone was fixed 1.7 metres above ground level, and within a distance no less than 5 metres from reflective surfaces. The meters were equipped with all-weather wind shields for the full duration of measurements. The noise meters were also calibrated at the start and end of the measurements, with a negligible recorded deviation of ≤0.5 dB. The survey was set to cover both working and weekend days, and the analysis of the measurements accounted for daytime (7 am to 11 pm) and night-time noise levels (11 pm and 7 am). A-weighted noise level measurements were made over continuous 24-hour durations and noise level data was logged at 10-minute intervals.

Based on average results for LA90, which is the best indicator for ambient noise (environmental) noise, noise levels within the vicinity of the PV plant mostly range from 42 dB(A) to 47 dB(A), for 90% of the time. Nevertheless, continuous sound pressure levels (LAeq) between 47 dB(A) and 51 dB(A). In general, daytime levels of ambient noise (in terms of LAeq) are well within both local and international limits for residential and commercial/ industrial zones. However, night-time levels of ambient noise in all the monitoring locations exceed local and international limits for residential zones.

Based on average results for LA90, noise levels within the vicinity of the BESS site range from 35 dB(A) to 38 dB(A), for 90% of the time. Nevertheless, continuous sound pressure levels (LAeq) vary between 41 dB(A) and 43 dB(A). In general, both daytime and night-time levels of ambient noise (in terms of LAeq) are well within both local and international limits for residential and commercial/ industrial zones.

POTENTIAL IMPACTS – CONSTRUCTION PHASE

Potential impacts on noise-sensitive establishments in the Project's construction phase include elevated levels of ambient noise, elevated levels of ambient ground borne vibration, and occupational exposure to noise and vibration.

Construction noise will arise from noise-generating activities including the pile driving, offloading of materials and equipment, movement of construction vehicles, and the operation of other construction machinery (e.g., excavators, compactors etc.). Construction vibration is expected to occur as a result of land clearing, grading, excavation, rock-breaking, compaction and pile driving. Different levels of ground borne vibration emanate from heavy construction machinery, such as bulldozers, excavators, graders, vibratory rollers, drill rigs, cranes, and Heavy Goods Vehicles (HGVs).

POTENTIAL IMPACTS – OPERATION PHASE

Potential impacts on noise-sensitive establishments in the Project's construction phase include elevated levels of ambient noise, and occupational exposure to noise and vibration. At the operational stage, noise emissions will arise from the operation of numerous and high-voltage electrical equipment. For PV plant facilities, these emissions potentially comprise low-frequency, humming noise from constituent inverters and medium-to-high voltage transformers. For the BESS plant, operational noise emissions will likewise be generated by the array of inverters and transformers, as well as the high-capacity Heating, Ventilation and Air Conditioning (HVAC) system. The movement of vehicles for transportation of O&M workers and transfer of materials and equipment for maintenance purposes may influence ambient noise levels.

IMPACT AVOIDANCE AND MITIGATION MEASURES

Provided the avoidance and mitigation measures specified in the C-ESMP and O-ESMP are implemented, the significance of the above-mentioned potential impacts will be reduced to a minor status. General mitigation requirements during construction include the location of noise- and vibration-generating machinery as far as possible from receptors within 500 metres' distance, use of noise shielding and mufflers, as well as minimizing simultaneous use of machinery and/or noise-generating activities. Mitigation in the Project's operational stage include the use of similar measures, particularly equipment enclosure and acoustic barriers such as a site fence, and the implementation O&M programs for various operational equipment.

5.5 Air Quality

BASELINE CONDITIONS

One monitoring location was considered representative of baseline air quality levels at sensitive establishments located within 300 metres of the PV plant site. The establishment is a residence located 10 metres from the eastern PV plant site boundary.

Dust dispersal from ongoing activities in and around the BESS site was not observed, with the exception of fugitive dust on unpaved sections of the adjacent access route during transit. No other prevalent air quality influences were noted within 2 kilometres of the site. Taking into consideration the absence of air pollution sources nearby the site and potentially sensitive establishments, quantitative air quality monitoring was not carried out. The nearest sensitive establishments around this site include two residential facilities located 150 and 300 north and south of the site respectively.

Baseline ambient air quality monitoring was undertaken between the 18th and 20th of June, 2023, using an air quality monitor (AQ Mesh), equipped with an anemometer. Air quality measurements were taken over a continuous 24-hour duration. Data for air quality parameters was logged at 15-minute intervals.

Average results for all air quality parameters measured near the PV power plant fall within national and WHO 24-hour guideline limits for air pollutants including particulate matter, with the exception of nitrogen dioxide. In addition, the analysis demonstrates that pre-project ambient concentrations of particulate matter (i.e., PM2.5 and PM10) meet the WHO guideline thresholds for this category of air pollutant.

Potential Impacts – Construction Phase

Potential impacts relating to air quality in the Project's construction phase include elevated levels of ambient dust, elevated levels of ambient exhaust pollutants, and occupational exposure to air pollutants. The generation of airborne dust will arise from site preparation activities and earthworks, including land clearance, excavation, grading, stockpiling, loading and off-loading of aggregates and circulation of construction vehicles. Grading works at the BESS site have the potential for severe dust dispersal due to the undulated terrain potentially requiring extensive cut and fill operations. The emission of exhaust fumes is also expected to occur due to the operation of various construction machinery, including earthworks equipment and Heavy Goods Vehicles (HGVs).

Potential Impacts – Operation Phase

Impacts on ambient air quality are not expected to occur in the Project's operational phase and have therefore been scoped out of the assessment.

Impact Avoidance and Mitigation Measures

Provided the avoidance and mitigation measures specified in the C-ESMP are implemented, the significance of the above-mentioned potential impacts will be reduced to a minor status. General mitigation requirements during construction include damping down of dust roads and working areas (commensurate with wind conditions), speed restrictions for HGVs, controlled grading technology for levelling at the BESS site (with uneven topography), controlled and sheltered unloading of aggregates with fine particulates, minimizing the usage of fuel powered machinery, implementation of O&M programs for various machinery, proper storage of construction materials containing Volatile Organic Compounds (VOCs) and appropriate storage and handling of putrescible domestic waste and wastewater.

5.6 Landscape and Visual Amenity

Baseline Conditions

The landscape surrounding the PV power plant site is characterized by a built-up environment including buildings, roads, and a patchwork of farmland. The landscape in and around the BESS site is less developed and includes extensive grassland and interlocking hills overlooking Karasu River (to the West), with more visual amenity for a few residential clusters residential facilities located nearby the site.

Potential Impacts – Construction Phase

Potential impacts on the landscape within affected viewsheds include the loss of visual amenity due to alteration of landscape character due to vegetation clearance, earthworks, and establishment of temporary obstructive structures and features (e.g., construction plants, vehicles etc.), as well as light spills from night-time movement of project vehicles and site illumination.

Potential Impacts – Operation Phase

Potential impacts on the character of local landscapes in and around the PV power plant and BESS sites include the loss of visual amenity due to alteration of landscapes of scenic value resulting from land conversion and the establishment of permanent structures (e.g. new fencing, sub-station towers and overhead transmission line). The establishment of the PV plant site will also result in glint and glare impacts due to the reflection of light from the PV modules, which may cause distraction and eye irritation.

Impact Avoidance and Mitigation Measures

Provided the avoidance and mitigation measures specified in the C-ESMP, Site Rehabilitation Plan and O-ESMP are implemented, the significance of the above-mentioned potential impacts will be reduced to a minor status. General mitigation requirements during construction include inward orientation and shielding of any on-site floodlights, and the implementation of site rehabilitation post construction demobilization. Mitigation measures during operations include the use of fitting, inconspicuous paintwork on prominent structures and vegetative screens around prominent/ protruding structures, to the extent feasible.

5.7 Traffic and Transportation

Baseline Conditions

The Project's international transit corridor will originate from a border post in China to custom points at Kolzhat in Kazakhstan. Subsequently, project components will be transported to custom points at the Yallama border post, and then onwards to route M-39 in Uzbekistan, and from rout M-39 to the project sites in Yukorichirchik and Parkent Districts. No constraints have been identified along the international transit corridor.

The PV plant site is located along the 4R-12 district highway, which links feeder roads within the districts of Yukorichirchik, Parkent and Kibray to the ring road along the outskirts of Tashkent City. The single carriageway is paved and in good condition. An existing 50-metre road links the PV plant site entry/exit gate to the highway (on the eastern side). This road will be used for site access, during construction. To prevent the congestion of construction vehicles during periods of peak construction traffic, an additional entry and exit gate will be established along the south-western site boundary. A traffic count carried out along the 4R-12 highway on 27th and 29th May indicate that traffic volumes along the 4R-12 highway has low-moderate traffic conditions.

The BESS site and the interconnection cable route can be accessed through an unpaved road branching out of the feeder road serving the Kavardan community situated south-west of the sites. The BESS site can also be accessed through an unpaved road, which lies further east (700 metres at most) from the main access track. This road was developed for the construction of a nearby overhead transmission line corridor, and it is generally wider. Considering the very low traffic conditions observed along these roads, baseline traffic counts were not carried out during the ESIA.

Potential Impacts – Construction Phase

Potential impacts relating to traffic and transportation during construction include increased traffic congestion along public roads within the Project's transit corridor and access tracks, due to the movement of project vehicles for the transportation of construction materials, equipment, and workers. Increases traffic congestion and increased travel times resulting from project traffic can disrupt local transportation patterns, impede timely access to workplaces and other key destinations, cause economic losses and present an inconvenience to road users.

Potential Impacts – Operation Phase

Impacts on traffic and transportation are not expected to occur in the Project's operational phase and have therefore been scoped out of the assessment.

IMPACT AVOIDANCE AND MITIGATION MEASURES

Provided the avoidance and mitigation measures specified in the C-ESMP and Traffic and Transportation Management Plan are implemented, the significance of the above-mentioned potential impacts will be reduced to a minor status. General mitigation requirements during construction include the development of dedicated access roads connecting to the PV plant and BESS sites, use of traffic signage, personnel, and suitable bypasses to control vehicular traffic in the event of project-related upgrading works on existing roads, use of dedicated parking bays, and the minimization of vehicular traffic by optimizing logistics and collective staff commutes, as well as the avoidance of peak traffic hours.

5.8 Cultural Heritage

BASELINE CONDITIONS

Archaeological sites found within 1 kilometre of the PV power plant and BESS sites include the Kavardan heritage site, Jetitepa heritage site, Karavultepa, Moltepa and Xitoyepa. The Kavardan heritage site is registered as a national archaeological object by the regional cultural heritage department, in accordance with the Resolution No.846 Approval of the National List of Immovable Property Objects of Tangible Cultural Heritage. The site encompasses the Kavardan city ruins, which date back two to three millenia Before Christ (BC) and includes features such as monuments and fortresses. The sites are not currently utilized by the local communities, and no designated UNESCO World Heritage Sites are present within the area.

The pre-construction archaeological survey carried out within the BESS site did not reveal the presence of any physical cultural resources within the site. Likewise, no intangible cultural heritage exists within the local communities based around the project sites and the nearby cultural heritage sites.

POTENTIAL IMPACTS – CONSTRUCTION PHASE

Potential impacts relating to cultural heritage during construction include the degradation and/ or loss of tangible cultural heritage resources due to earthworks, compaction, drilling, the movement of heavy construction machinery, as well as off-roading and trespassing incidents in and around the BESS and underground cable sites.

The Project's construction phase may also entail the disruption of local customs and intangible cultural heritage as a result of the influx of a considerably large migrant workforce into the Project's host communities, erosion of local cultural values and possible tension and conflicts

arising out of cultural fissures between the migrant project labour and local community members.

Potential Impacts – Operation Phase

Impacts on cultural heritage are not expected to occur in the Project's operational phase and have therefore been scoped out of the assessment.

Impact Avoidance and Mitigation Measures

Provided the avoidance and mitigation measures specified in the C-ESMP and Archaeological Chance Finds Procedure are implemented, the significance of the above-mentioned potential impacts will be reduced to a minor status. The key mitigation requirements during construction include the prohibition of construction works outside of demarcated sites and working areas, observation of protective buffers around existing archaeological sites nearby the project area, implementation of the archaeological watching brief (supervision) for earthworks within the BESS site, as well as the use of dedicated accommodation facilities for project workers and compulsory worker trainings in the Project's Code of Conduct, respect for local customs, and known tangible cultural heritage within 1 kilometre of the project sites.

5.9 Socioeconomics

Baseline Conditions

A total of nine local communities are located in and around the PV power plant, BESS and underground interconnection cable sites, namely Sergeli, Tashtogizoq, Yangiobod, Gulobod, Istiqbol, Istiqlol, Taraqqiyot, Qirgizovul, and Kavardan.

The PV plant site is bordered by Chirchik River to the west, an agricultural zone (for aquaculture and fruit gardening) to the north, the 4R-12 highway overlooking Istikklol and Taraqqiyot communities to the east, a residential (Istiqlol) community to the south-east, and a chain of light-industry and commercial establishments to the south. Commercial entities located south of the site include a regional grain storage facility, cotton-processing factory and a developing recreational site that features aquaculture (for recreational fishery). Major utility assets nearby the PV plant site include the existing 220kV OTL (south and east of the site), a Class I operational gas pipeline located about 300 metres north of the site, as well as well as pipework stemming from the Uzsuvtaminot waterworks to the utility zone located on the western side of Chirchik River.

One part time residence is located north of the site, and a farmstead are located south of the BESS site (and closer to the interconnection route). Utility assets located close to the BESS site

include the Parkent sub-station, a number of resident OTLs and another Category I gas pipeline, which lies more than 300 metres away from the site but potentially intersects with the route of the underground interconnection cable. Further, q burial site is also located about one kilometre southwest of the BESS site.

A socio-economic profile of the Project's primary Area of Influence was developed through a socio-economic survey of households in the project-affected communities, which was undertaken between 11th and 18th of July 2023. A total of 254 households were surveyed, and the findings of this survey are provided in Volume II (Main Text) of the ESIA Report. The main livelihoods within the project-affected districts includes crop farming, livestock rearing and waged employment. While a number of socioeconomically vulnerabilities exist within the project-affected communities, Indigenous Peoples (IPs) were not identified within the communities.

Potential Impacts – Construction Phase

Potential impacts relating to livelihoods and social services in the Project's construction phase include economic displacement due to land expropriation and temporary land access restrictions during construction, accidental damage to public property and utility service interruptions, increased pressure on public infrastructure and resources, transient inflation within host communities, as well as employment creation and capacity transfer.

Potential Impacts – Operation Phase

At the operational stage, the Project presents augmented power supply and associated economic growth.

Impact Avoidance and Mitigation Measures

Provided the avoidance and mitigation measures specified in the C-ESMP are implemented, the significance of the above-mentioned potential impacts will be reduced to a minor status. The key supplementary plans that will be implemented for the management of impacts on local livelihoods and social services include the Land Acquisition and Livelihood Restoration Plan (LALRP), Local Content Plan, Influx Management Plan, Water Management Plan, and Traffic and Transportation Management Plan.

5.10 Community Health, Safety and Security

Baseline Conditions

With regards to morbidity within the nine project-affected communities, the ESIA-stage socioeconomic survey (including a total of 254 households) revealed that the most common

diseases within the communities include respiratory infections and cardiovascular conditions. Survey results indicate that only 40% of surveyed households within the project-affected communities have access to medical facilities within a distance of 5km.

According to national statistics, Tashkent Region has had the highest crime rates in Uzbekistan, with Fergana and Samarkand Regions ranking second and third respectively. The majority of recorded crimes in 2022 were perpetrated by men. Authorities responsible for law enforcement, maintenance of order and investigation of crimes within the host region, districts and makhallas include the local police force, operating under the Ministry of Internal Affairs and the National Security Service. In Uzbekistan, training, planning and emergency response to fire, floods and other disasters is coordinated by the Ministry of Emergency Situations. Several commercial fire response and rescue entities also provide fire emergency services, particularly within urban centres and Tashkent Region.

The cultural context of Uzbekistan is characterized by patriarchal customs, which have historically influenced gender equality in the spheres of education, employment, and national politics. With regard to the prevalence of gender-based human rights violations within the country, various forms of violence, harassment and exploitation have been reported in recent years.

Potential Impacts – Construction Phase

Potential impacts relating to community health, safety and security in the Project's construction phase include spread of communicable diseases and increased local morbidity due to the influx of migrant workers (and inter-mingling with local communities), community health and safety incidents resulting from various on-site and off-site construction hazards, as well as criminal and abusive offences against local community members.

Potential Impacts – Operation Phase

Potential impacts relating to community health, safety and security in the Project's construction phase include community health and safety incidents (e.g., electrocution accidents, Electromagnetic Field (EMF) hazards and related incidents, traffic accidents, and fire hazards and related accidents).

Impact Avoidance and Mitigation Measures

Provided the avoidance and mitigation measures specified in the C-ESMP and O-ESMP are implemented, the significance of the above-mentioned potential impacts will be reduced to a minor status. The key supplementary plans that will be implemented for the management of impacts on community health, safety and security include the dedicated Community Health and Safety Plan, Influx Management Plan, Hazardous Materials and Waste Management Plan,

and Emergency Preparedness and Response Plan, during construction, as well as the Hazardous Materials and Waste Management Plan, Community Health and Safety Plan, and Emergency Preparedness and Response Plan, during operations.

5.11 Labour Conditions and Occupational Health and Safety

BASELINE CONDITIONS

The various challenges that beset the labour rights context of Uzbekistan are discussed in Volume I (Main Text) of the ESIA report. A summary of forced labour within the Chinese Xinjiang Ughur Autonomous Region (XUAR) is also provided in Volume II of the report.

POTENTIAL IMPACTS – CONSTRUCTION PHASE

Potential impacts relating to working conditions and occupational health and safety in the Project's construction phase include unequal access to employment opportunities and benefits due to discriminatory and/or exploitative recruitment practices, poor working and living conditions, occupational health and safety incidents, forced labour, child labour, and workplace harassment, violence and other security incidents involving project workers.

POTENTIAL IMPACTS – OPERATION PHASE

Potential impacts relating to working conditions and occupational health and safety in the Project's operation phase include unequal access to employment opportunities and benefits due to discriminatory and/or exploitative recruitment practices, occupational health and safety incidents, forced labour, child labour and workplace harassment, violence and other security incidents involving project workers.

IMPACT AVOIDANCE AND MITIGATION MEASURES

Provided the avoidance and mitigation measures specified in the C-ESMP and O-ESMP are implemented, the significance of the above-mentioned potential impacts will be reduced to a minor status. The key supplementary plans that will be implemented for the management of construction-phase impacts on labour conditions and occupational health and safety include a dedicated Local Content Plan, Retrenchment Plan, Occupational Health and Safety Plan, Emergency Preparedness and Response Plan, Worker Accommodation Plan and Supply Chain Management Plan, alongside the project-level Human Resource Policy, Human Rights Policy and Code of Conduct. An equivalent set of management plans and policies will be developed for labour related risks and impacts in the Project's operational phase.

5.12 Climate Risks

Baseline Conditions

Mean annual air temperatures have risen steadily and significantly in Uzbekistan over the past few decades, with varying rates of increase. Between 1990 and 2020, the country's mean annual temperature grew at a rate of 0.03°C per decade. A review of recent literature and information gathered from local communities during ESIA-oriented consultations and socioeconomic surveys indicates that there have not been any major dry spells or extended periods of drought in Yukorichirchik and Parkent districts.

To understand possible temperature and precipitation extremes within the Project's operational phase, in the high-emissions scenario, climatological projections were performed for the period 2040-2059, based on the Shared Socioeconomic Pathway (SSP) 5 (Fossil Fuel Development), paired with the Representative Concentration Pathway (RCP) 8.5.

The projected rise in average maximum temperature appears to culminate in the months of March and July, at which time maximum temperatures are likely to increase by up to 4°C, on average. This magnitude of increase would elevate average maximum temperature in the region to 32.6°C. the projected rise in average largest 1-day precipitation appears to culminate in May/June, at which time largest 5-day precipitation levels are likely to increase by up to 20 mm, on average. This magnitude of increase would elevate average maximum precipitation in the region to 45 mm.

Climatic Risks

The Project is subject to several physical climate risks associated with the projected temperature and precipitation extremes, including reduction in solar module efficiency and yield under high temperatures, thermal runaway and associated fire hazards due to failure of BESS cooling systems under high temperatures, damage to PV plant and BESS infrastructure due to flooding from high-precipitation events and associated dam failure, power shortages and socioeconomic losses due to climate-related plant downtime (forced outage), as well as E&S incidents resulting from climatic extremes and disasters.

A number of avoidance measures have been incorporated into various aspects of the project design (e.g., site selection away from flood prone areas, foundation design and PV module selection), and additional climate-proofing measures for fire safety, lightning protection, HVAC cooling systems for the BESS and drainage systems are also planned to mitigate climate-related risks to the project infrastructure. In addition, construction- and operation-phase greenhouse gas emissions will be minimized using the Traffic and Transportation Management Plan, and O&M programs for project equipment and vehicles.

6 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING

The construction-phase and operation-phase ESMS will need to incorporate mitigation and monitoring requirements established in Volume 2 of the ESIA, as well as any additional requirements prescribed by the Ministry of Ecology, Environmental Protection and Climate Change (MPEECC).

Volume 3 of the ESIA provides a framework for the development of the Environmental and Social Management System (ESMS) for the construction and operational phases of the Project. The framework has been developed to ensure that all environmental and social impacts identified for both construction and operational phases are appropriately identified and controlled through the development of a robust construction and operational phase ESMS.

The Project Company will institute ESMS Manuals for both project phases to ensure there is sufficient oversight of the ESMS implementation within the Project Company, EPC and O&M Companies, and their respective primary sub-contractors and suppliers, and to ensure project-wide compliance, E&S risk and opportunity management including monitoring.

Note: Competent authorities such as Uzsuvtaminot, Institute of Archaeology, Cultural Heritage Agency and Uztransgaz will play an active role in the implementation of C-ESMP impact mitigation and monitoring requirements which align with the mandates and internal policies of these authorities (i.e., aquifer protection and management of spills around water supply facilities, protection of known and unknown tangible cultural heritage and safe earthworks and electrical installations around the gas pipeline intersecting the underground cable route).

The primary documents guiding the environmental and social management of the construction and operational phases will be the construction-phase and operation-phase Environmental and Social Management Plans (C-ESMP, O-ESMP) respective to construction and operational E&S risks, impacts and compliance requirements. Detailed monitoring arrangements and requirements will be presented in the Environmental and Social Monitoring Plan, and other supplementary E&S management plans.

6.1 Independent Auditing and Monitoring

The Project will be subject to periodic independent monitoring in accordance with the requirements of the Environmental and Social Action Plan (ESAP) and an Equator Principle Action Plan (EPAP) prepared by the Project Lenders. This line of E&S monitoring will focus on the implementation of the project ESMS and evaluate on-site activities, documented E&S impact controls and relevant monitoring efforts, with respect to the Project's compliance obligations.

APPENDIX A – PROJECT CONTACT INFORMATION

Table A-6-1 Project Contact Information